

## CLAIMS

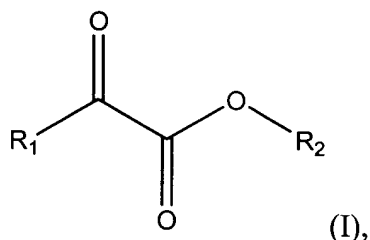
What is claimed is:

1. A method of treating a patient having a cytokine-mediated inflammatory condition, said method comprising the steps of:
  - 5 (a) providing said patient having an inflammatory condition mediated by a cytokine wherein the condition is selected from the group consisting of rheumatoid spondylitis, osteoarthritis, gouty arthritis, endotoxic shock, cerebral malaria, silicosis, pulmonary sarcoidosis, bone resorption disease, graft versus host disease, allograft rejections, fever and myalgia due to infection, AIDS  
10 related complex (ARC), Crohn's disease, rheumatoid arthritis, cachexia and septic shock; and
  - (b) administering to said patient an effective amount of a composition comprising an ester of an alpha-ketoalkanoic acid in  
15 a pharmaceutically acceptable inert carrier substance.
2. The method of Claim 1, wherein said ester is an ester of a C3 to C8, straight chained or branched alpha-ketoalkanoic acid.
- 20 3. The method of Claim 2, wherein said ester is an ester of an alpha-ketoalkanoic acid selected from the group consisting of alpha-keto-butyrate, alpha-ketopentanoate, alpha-keto-3-methyl-butyrate, alpha-keto-4-methyl-pentanoate or alpha-keto-hexanoate.
- 25 4. The method of Claim 2, wherein said ester is an ester of pyruvic acid.
5. The method of Claim 2, wherein said ester of an alpha-ketoalkanoic acid is an alkyl, aralkyl, carboxyalkyl, glyceryl or dihydroxy acetone ester.

6. The method of Claim 2, wherein said ester of alpha-ketoalkanoic acid compound is an ethyl, propyl, butyl, carboxymethyl, acetoxymethyl, carbethoxymethyl and ethoxymethyl ester.
- 5 7. The method of Claim 5, wherein said ester of alpha-ketoalkanoic acid is ethyl pyruvate.
8. The method of Claim 1, wherein said carrier further includes a biologically safe component for inducing and stabilizing enolization of the alpha-keto  
10 functionality of said ester at physiological pH values.
9. The method of Claim 8, wherein said component for inducing and stabilizing enolization of the alpha-keto functionality of said ester is an inorganic, divalent cation.  
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10. The method of Claim 9, wherein said divalent cation is calcium or magnesium.
11. The method of Claim 1, wherein said alpha-ketoalkanoic acid portion of said ester is alpha-ketopropionic acid.  
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12. The method of Claim 1, wherein said alpha-ketoalkanoic acid ester is ethyl pyruvate, said divalent cation is calcium and said inert carrier substance is Ringer's solution in a pH range of 7-8.
- 25 13. The method of Claim 1, wherein said inert carrier is a Ringer's solution of isotonic saline supplemented with potassium ion.
14. The method of Claim 1, wherein said ester of an alpha-ketoalkanoic acid is selected from the group consisting of ethyl 2-keto-butyrate, ethyl 2-

ketopentanoate, ethyl 2-keto-3-methyl-butyrate, ethyl 2-keto-4-methyl-pentanoate and ethyl 2-keto-hexanoate.

15. The method of Claim 1, wherein said ester of an alpha-ketoalkanoic acid  
5 compound is admixed in a saline solution, said solution containing a cation selected from the group consisting of calcium and magnesium.
16. A method of treating a patient having a cytokine-mediated inflammatory  
10 condition, said method comprising the steps of:
- (a) providing said patient having an inflammatory condition mediated by a cytokine; and
  - (b) administering to said patient an effective amount of a composition comprising a compound of Formula (I) in a  
15 pharmaceutically acceptable inert carrier:



wherein

R<sub>1</sub> is methyl, ethyl, propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, pentyl, 4-methylpentyl, 3-methylpentyl, hexyl, heptyl, octyl, 1-phenylmethyl or 2-phenyl-ethyl;

R<sub>2</sub> is ethyl, propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, pentyl, 4-methylpentyl, ethoxymethyl, 2-ethoxyethyl, carboxymethyl or ethoxycarbonylmethyl.

17. The method of Claim 16 wherein the patient is administered a composition consisting essentially of the compound of Formula (I) in a pharmaceutically acceptable inert carrier.

18. The method of Claim 16, wherein the compound of Formula (I) is selected from the group consisting of an ester of alpha-keto-butyrate, an ester of alpha-ketopentanoate, an ester of alpha-keto-3-methyl-butyrate, an ester of alpha-keto-4-methyl-pentanoate and an ester of alpha-keto-hexanoate.
19. The method of Claim 16 wherein the composition comprising a compound of Formula (I) is administered orally, intranasally, subcutaneously, intramuscularly, intravenously, intralumenally, intra-arterially, intravaginally, transurethrally or rectally.
20. The method of Claim 16 wherein R<sub>2</sub> is ethyl.
21. The method of Claim 16 wherein the compound is ethyl pyruvate, propyl pyruvate, carboxymethyl pyruvate, ethoxymethyl pyruvate, ethyl alpha-keto-butyrate, ethyl alpha-keto-pentanoate, ethyl alpha-keto-3-methyl-butyrate, ethyl alpha-keto-4-methyl-pentanoate, or ethyl alpha-keto-hexanoate.
22. The method of Claim 16 wherein the compound is ethyl pyruvate.
23. The method of Claim 17 wherein the compound is ethyl pyruvate.
24. The method of Claim 16, wherein said composition is administered 24 hours after onset of said inflammatory condition.
25. The method of Claim 16, wherein said carrier further comprises a biologically safe component for inducing and stabilizing enolization of the alpha-keto functionality of said acid at physiological pH values.

26. The method of Claim 25, wherein said component for inducing and stabilizing enolization of the alpha-keto functionality of said ester is an inorganic, divalent cation.
- 5 27. The method of Claim 26, wherein said divalent cation is calcium or magnesium.
28. The method of Claim 16, wherein said inert carrier is Ringer's solution in a pH range of 7-8.
- 10 29. The method of Claim 16, wherein said inert carrier is a Ringer's solution of isotonic saline supplemented with potassium ion.
30. The method of Claim 16, wherein the compound of Formula (I) is admixed in a saline solution, said solution containing a cation selected from the group  
15 consisting of calcium and magnesium.
31. The method of Claim 16, wherein said inflammatory condition is inflammatory bowel disease, rheumatoid arthritis, asthma, sepsis or septic shock.